

CLAIMS

1. A vehicle skid control device of controlling a power system that outputs power to a drive shaft linked to drive wheels of a vehicle, said vehicle skid control device comprising:

an angular acceleration measurement module that measures an angular acceleration of the drive shaft;

a skid detection module that detects occurrence of a skid of the drive wheels according to the angular acceleration measured by said angular acceleration measurement module;

a torque restriction module that, in response to detection of the occurrence of a skid by said skid detection module, restricts a driving torque of the drive wheels to reduce the skid;

a state determination module that determines whether a current vehicle driving state causes a variation in angular acceleration with no occurrence of a skid; and

a torque restriction prohibition module that prohibits said torque restriction module from restricting the driving torque of the drive wheels, when said state determination module determines that the current vehicle driving state causes the variation in angular acceleration with no occurrence of a skid.

2. A vehicle skid control device of controlling a power system that outputs power to a drive shaft linked to drive

wheels of a vehicle, said vehicle skid control device comprising:

an angular acceleration measurement module that measures an angular acceleration of the drive shaft;

5 a skid detection module that detects occurrence of a skid of the drive wheels according to the measured angular acceleration;

a torque restriction module that, in response to detection of the occurrence of a skid by said skid detection
10 module, restricts a driving torque of the drive wheels to reduce the skid;

a torque variation detection module that determines whether a variation in torque command value of the drive wheels caused by a driver's accelerator operation is within a preset
15 range; and

a torque restriction prohibition module that prohibits said torque restriction module from restricting the driving torque of the drive wheels, when said torque variation detection module determines that the variation in torque
20 command value is out of the preset range.

3. A vehicle skid control device of controlling at least one of an engine and a motor of a power system that outputs power to a drive shaft linked to drive wheels of a vehicle, said vehicle skid control device comprising:

25 an angular acceleration measurement module that measures an angular acceleration of the drive shaft;

a skid detection module that detects occurrence of a skid of the drive wheels according to the measured angular acceleration;

a torque restriction module that, in response to
5 detection of the occurrence of a skid by said skid detection module, restricts a driving torque of the drive wheels to reduce the skid;

an engine vibration detection module that detects a vibration at a start of the engine; and

10 a torque restriction prohibition module that prohibits said torque restriction module from restricting the driving torque of the drive wheels, in response to detection of the vibration at the start of the engine by said engine vibration detection module.

15 4. A vehicle skid control device in accordance with any one of claims 1 through 3, wherein said skid detection module detects the occurrence of a skid when the angular acceleration measured by said angular acceleration measurement module increases over a preset threshold value.

20 5. A vehicle skid control device of controlling a power system that outputs power to a drive shaft linked to drive wheels of a vehicle, said vehicle skid control device comprising:

an angular acceleration measurement module that
25 measures an angular acceleration of the drive shaft;

a skid detection module that detects occurrence of a skid

of the drive wheels when the measured angular acceleration increases over a preset threshold value;

a torque restriction module that, in response to detection of the occurrence of a skid by said skid detection
5 module, restricts a driving torque of the drive wheels to reduce the skid;

a time variation attribution module that determines whether a time variation in angular acceleration, which is measured by said angular acceleration measurement module,
10 after the increase over the preset threshold value is attributable to mechanical resonance; and

a torque restriction prohibition module that prohibits said torque restriction module from restricting the driving torque of the drive wheels, when said time variation
15 attribution module determines that the time variation in angular acceleration after the increase over the preset threshold value is attributable to the mechanical resonance.

6. A vehicle skid control device in accordance with claim 5, wherein said time variation attribution module determines
20 whether a time width between the increase in angular acceleration crossing over the preset threshold value and a start of a decreasing tendency of the angular acceleration is attributable to the mechanical resonance.

7. A vehicle skid control device in accordance with any
25 one of claims 4 through 6, wherein said torque restriction prohibition module does not prohibit said torque restriction

module from restricting the driving torque of the drive wheels, when the angular acceleration measured by said angular acceleration measurement module exceeds a non-skid upper limit, which is set to be larger than the preset threshold value.

5 8. A vehicle skid control device in accordance with any one of claims 1 through 7, wherein said torque restriction prohibition module suspends the function of said torque restriction module or sets an unexpectedly large value to the threshold value adopted in said skid detection module, so as
10 to eliminate effectiveness of said torque restriction module and accordingly interfere with the restriction of the driving torque of the drive wheels by said torque restriction module.

 9. A vehicle skid control device in accordance with any one of claims 1 through 8, wherein said torque restriction
15 prohibition module prohibits said torque restriction module from restricting the driving torque of the drive wheels for a predetermined restriction prohibition time.

 10. An automobile with a vehicle skid control device in accordance with any one of claims 1 through 9 mounted thereon.

20 11. A vehicle skid control method of controlling a power system that outputs power to a drive shaft linked to drive wheels of a vehicle, said vehicle skid control method comprising the steps of:

 (a) measuring an angular acceleration of the drive shaft;
25 (b) detecting occurrence of a skid of the drive wheels according to the measured angular acceleration;

(c) in response to detection of the occurrence of a skid by said step(b), restricting a driving torque of the drive wheels to reduce the skid;

(d) determining whether a current vehicle driving state
5 causes a variation in angular acceleration with no occurrence of a skid; and

(e) prohibiting restriction of the driving torque of the drive wheels by said step(c), when said step(d) determines that the current vehicle driving state causes the variation in
10 angular acceleration with no occurrence of a skid.

12. A vehicle skid control method of controlling a power system that outputs power to a drive shaft linked to drive wheels of a vehicle, said vehicle skid control method comprising the steps of:

15 (a) measuring an angular acceleration of the drive shaft;

(b) detecting occurrence of a skid of the drive wheels according to the measured angular acceleration;

(c) in response to detection of the occurrence of a skid by said step(b), restricting a driving torque of the drive
20 wheels to reduce the skid;

(d) determining whether a variation in torque command value of the drive wheels caused by a driver's accelerator operation is within a preset range; and

(e) prohibiting restriction of the driving torque of the
25 drive wheels by said step(c), when said step(d) determines that the variation in torque command value is out of the preset

range.

13. A vehicle skid control method of controlling at least one of an engine and a motor of a power system that outputs power to a drive shaft linked to drive wheels of a vehicle,
5 said vehicle skid control method comprising the steps of:

(a) measuring an angular acceleration of the drive shaft;

(b) detecting occurrence of a skid of the drive wheels according to the measured angular acceleration;

(c) in response to detection of the occurrence of a skid
10 by said step(b), restricting a driving torque of the drive wheels to reduce the skid;

(d) detecting a vibration at a start of the engine; and

(e) prohibiting restriction of the driving torque of the drive wheels by said step(c), in response to detection of
15 the vibration at the start of the engine by said step(d).

14. A vehicle skid control method of controlling a power system that outputs power to a drive shaft linked to drive wheels of a vehicle, said vehicle skid control method comprising the steps of:

20 (a) measuring an angular acceleration of the drive shaft;

(b) detecting occurrence of a skid of the drive wheels when the measured angular acceleration increases over a preset threshold value;

(c) in response to detection of the occurrence of a skid
25 by said step(b), restricting a driving torque of the drive wheels to reduce the skid;

(d) determining whether a time variation in the measured angular acceleration after the increase over the preset threshold value is attributable to mechanical resonance; and

(e) prohibiting restriction of the driving torque of the
5 drive wheels by said step (c), when said step (d) determines that the time variation in angular acceleration after the increase over the preset threshold value is attributable to the mechanical resonance.